EXECUTIVE SUMMARY

Introduction

The *Lower East Coast Regional Water Supply Plan* is a blueprint to meeting the water resource needs of a fast growing region. A technical analysis of the planning area's future water needs and the availability of water supplies indicates that extensive actions are required if a sustainable water supply will be available for the people of South Florida. Recommendations in this plan will achieve these needs. Analysis shows that the recommended projects must be built on schedule or the region will face a significant increase in the risk of water shortages.

The Lower East Coast (LEC) Planning Area is expected to experience substantial growth between now and 2020. Increasing by almost 58 percent from 1995. Most of this growth will occur in the coastal areas, exceeding seven million people in 2020. This growth will create additional water demands for potable and irrigation water. Agricultural land uses, primarily row crops, ornamental horticulture and sugarcane, water demand is projected to decrease by seven percent reflecting a reduction in the area cultivated to approximately 480,000 acres. The overall water demands of consumptive users is projected to increase by 20 percent to 2.52 billion gallons per day on average. In addition to human's consumption of water, it is recognized that to sustain and restore the natural systems of South Florida, significant increases in water supply deliveries will be needed. To meet water demands and restore the critical ecosystems in the coastal estuaries, Lake Okeechobee, the Everglades, and the Biscayne Bay, development of proactive water resource projects is imperative. The South Florida Water Management District (District) is primarily responsible for water resource development and, when appropriate and when resources are available, will support water supply development at the local level. Local governments, water users, and water utilities are primarily responsible for implementing water supply development.

Purpose

The purpose of this plan is to fulfill the requirements of Chapter 373.0361, Florida Statutes, for regional water supply plans. Implementing a plan, which complies with the statutory requirements, will ensure significant benefits to the people in South Florida and the natural systems by providing guidance, funding, and resources needed to develop the regional and local water supply.

Achievements

The implementation of the LEC Plan will do the following:

- Create a water supply that fully meets the 2020 needs of more than seven million people and the remaining agricultural industries in a 1-in-10-year drought

- Reduce the number and severity of violations of Minimum Flow and Levels (MFL) criteria for the Everglades, Lake Okeechobee, and the Biscayne aquifer by 2020
- Reserve from allocations sufficient water to allow for the restoration of the Everglades and enhancement of other significant natural systems
- Reduce the uncertainty for issuing longer-term permits (greater certainty) for water users as they invest in tomorrow's water supply infrastructure
- Provide public forums to modernize District operational procedures and promote greater annual flexibility in the operation of the regional water management system

Relationship with Comprehensive Everglades Restoration Plan

To avoid duplication of effort, in 1997, the District merged its *LEC Regional Water Supply Plan* analysis of major water storage facilities into the Restudy process. The Restudy refers to the multiyear planning effort the U.S. Army Corps of Engineers and the District completed in July 1999. The water supply planning efforts completed from 1992 to 1997 for the *LEC Regional Water Supply Plan* formed the foundation for analytical tools, evaluation techniques, and storage projects for the Restudy. In 1999, this *LEC Regional Water Supply Plan* incorporated the results of the Restudy, the construction and operation features, back into the state planning process to determine how much water can be made available from the regional system through the state regulatory program. The state water supply planning process also verified if the sequencing of the proposed Restudy components at five-year increments through 2020 would protect existing legal water users, water resources from significant harm, and balance the future water needs of the region.

Statutory Requirements

The LEC Plan integrates the federal water management process (Comprehensive Everglades Restoration Program) into the state process, described in Section 373.0361, F.S. and other pertinent sections of Chapter 373, F.S. by including as follows:

- Analysis is based on at least a 20-year planning period
- Water supply demands are estimated for all existing and future users and the environment up to a 1-in-10 year level of certainty
- Water resource development projects, implementation schedules, costs, and funding strategies are included
- Descriptions of water supply development projects, their effectiveness, and estimated cost to implement are provided

- MFLs for four priority water bodies and MFL recovery and prevention strategies are outlined and development of MFLs and recovery strategies for other water bodies are recommended
- Technical data and information to support the plan are included

Process

This planning document is the product of a public process, which relied heavily on an advisory committee of diverse membership representing agricultural, urban, and environmental interests. Public participation was initiated in 1992 with the formation of the LEC Regional Water Supply Plan Advisory Committee, continued through the completion of the *Interim Plan for Lower East Coast Water Supply* in March 1998 and culminated most recently with the completion of this 20-year plan.

Two existing hydrologic models, the South Florida Water Management Model and the Natural System Model, and five recently developed high resolution ground water models were applied to analyze how the hydrology of South Florida performs under future conditions. Projections for urban and agricultural water demands and sources were incorporated, as well as future land use projections, construction of water management features, such as the Everglades Construction Project, and operation features such as the Water Supply and Environmental schedule for Lake Okeechobee. Performance measures were applied to evaluate the computer simulations. The performance measures relate to the goals of the plan, provide water to meet a 1-in-10 year level of certainty, and provide for hydrologic restoration of the Everglades through 2020.

Other planning efforts are linked to the LEC Plan and are important to meeting its objectives Three District plans, Lower West Coast and Kissimee water supply plans and the Caloosahatchee Water Mangement Plan were approved by the Governing Board in April 2000. Two federal planning process, Water Perserve Area and Southwest Florida feasibility studies, are underway. These other efforts were integrated to the greatest degree possible with the LEC planning process. The Caloosahatchee Water Management Plan evaluated water supply in an area linked to the LEC Planning Area by virtue of its dependence on Lake Okeechobee. Its recommendations are included as part of this regional water supply plan. Additional integration of the this plan's analysis will occur as part of these related planning efforts or as part of the periodic updates of the water supply plans. This plan will be reviewed and updated at least every five years to ensure that the water needs of LEC Planing Area can be met.

Conclusions of Analysis

It was concluded that with construction of the Comprehensive Everglades Restoration Project (CERP), appropriate management and diversification of water supply sources, there is sufficient water to meet the needs of the region up to and including a 1-in-10 year drought condition. Results of the analysis concluded that the LEC Planning Area could meet a 1-in-10 year level of certainty for urban and agricultural demands by 2020 if the CERP projects, other proposed LEC water resource development projects, and water

supply development options are implemented. Urban areas may reach a 1-in-10 year level of certainty by 2010 and agricultural users dependent on Lake Okeechobee by 2015 if the construction and operational features in the *LEC Regional Water Supply Plan* are implemented. The proposed MFLs will also be achieved in Lake Okeechobee, the Everglades, and the Biscayne aquifer by 2020. Also, a majority of the 2020 restoration targets for the Everglades can be met if this plan is implemented. Full Everglades restoration is not possible until 2037 when all CERP projects are completed.

Recommendations for water resource development

The *LEC Regional Water Supply Plan* recommends water resource development projects and lists water supply development options available to public water suppliers. Of the forty-seven recommendations, the primary water resource development projects will be completed as part of the CERP. The District and local sponsor costs for the first five years of implementation are expected to be $920,841,000; the 20-year costs are estimated at $2,722,220,000. The recommendations fall into eight categories with the District and local five-year (FY 2001 - 2005) and 20-year (FY 2001 - 2020) costs as follows:

- Continuation of twelve projects from the *Interim Plan for Lower East Coast Water Supply*; five year: $19,509,000, 20 year: $33,789,000
- Other federal, state, and District projects, which encompass Mobile Irrigation Labs to working with the U.S. Environmental Protection Agency (USEPA), and the Florida Department of Environmental Protection (FDEP) on Aquifer Storage and Recovery (ASR) permitting issues; five year: $4,245,000, 20 year: $4,245,000
- Completion of the CERP's water resource development projects and operational improvements in the LEC Planning Area; 5 year : $746,228,000, 20 year: $2,410,592,000
- Recommendations to CERP, based on analysis completed by the *LEC Regional Water Supply Plan*, demonstrated improved performance of ten CERP projects (this analysis should continue and be incorporated into the CERP's Project Implementation Report (PIR) and RECOVER processes): the costs are part of CERP process
- Three projects recommended by the Caloosahatchee Water Management Plan; five year: $147,189,000, 20 year: $269,924,000
- Develop of operational flexibility for the Central and Southern Florida Project to try to meet hydrologic targets prior to completion of the major storage features and manage of Lake Okeechobee's vegetation if and when water levels permit; 5 year: $750,000, 20 year: $750,000

- Complete rules for consumptive use permits, reservation of water for fish and wildlife and public health and safety, and MFLs and complete research needed to establish other MFLs; 5 year: $320,000, 20 year: $320,000
- Further investigations into long-term water supply development options, such as conservation, indirect aquifer recharge, regional irrigation facilities, and seawater reverse osmosis; 5 year: $2,600,000, 20 year: $2,600,000.

Implementation of the CERP is critical to meeting the state mandates for level of certainty for water users and MFLs, as well as meeting restoration targets for natural systems. Implementation of the *LEC Regional Water Supply Plan*, in conjunction with the CERP, the *CWMP*, and the Southwest Florida Study, should avert water shortages and harm to the environment in a 1-in-10 year drought. However, successful implementation of the *LEC Regional Water Supply Plan* is dependent on completing the rule development for MFLs, reservations of water for the environment, and consumptive use permits.

The *CWMP* determined the newly revised projected surface water needs of the Caloosahatchee River basin and estuary can be met based on recommended water management and storage infrastructure that effectively capture and store surface water flows in the basin. The *CWMP* recommendations for modifications to demand projection methodology, ASR Pilot Project, and the C-43 Storage Project will be referred to the CERP and the Southwest Florida Study. As in the LEC Planning Area, meeting the 1-in-10 year level of certainty is dependent on completing the CERP projects.

Recommendations for water supply development

This analysis concluded that the traditional source for public water, the surficial aquifer systems, has potential for expansion but is limited in some areas due to potential impacts on wetland systems and increased potential for saltwater intrusion in coastal areas in the vicinity of public water supply wellfields. With completion of the water resource development projects and more efficient use of regional and local water supplies, the water available for local uses will expand. However, coastal areas with limited access to regional water are more likely to require implementation of one of the water supply development options described in the *LEC Regional Water Supply Plan*.

Eight water source options were identified to address the water supply needs of the LEC Planning Area. These options either make additional water available from historically used sources or other sources, or provide additional management through conservation and storage of water. The options are (no implied priority) as follows:

- Conservation
- Surficial Aquifer System
- Floridan Aquifer System
- Reclaimed Water
- Seawater
- ASR
- Reservoirs
- Surface Water

Strong emphasis will be placed on water conservation through implementation of a comprehensive water conservation program. Conservation would be encouraged through cooperative efforts among water users, utilities, local governments, and the District. These efforts will incorporate many initiatives, including continued development and compliance with water conservation ordinances, development and implementation of public education programs, use of alternative water sources, continued emphasis on water conservation in the District's surface water and consumptive use permitting programs, and other means. Local governments and users will play a key role in making these strategies a success, through adoption of conservation ordinances, homeowner awareness programs, land use decisions, and development of water supply options by local governments, utilities, and water users.

The Floridan aquifer appears to be a promising source for additional potable water needs in areas with limited access to regional supplies. Several public water utilities have already begun utilizing the Floridan aquifer by using reverse osmosis technology, which removes salt from the saline water in the Floridan aquifer. Little is known about long-term water quality impacts of sustained withdrawals from this aquifer making refinement to the Floridan aquifer ground water model and water quality and water level monitoring of the Floridan aquifer important to this region.

From a regional perspective, the use of fresh ground water sources, reclaimed water, surface water, and storage through development of a regional or subregional irrigation water distribution system(s) will be sufficient to meet the urban irrigation demands. Water from the surficial aquifer system and reclaimed water have been used historically to meet these demands. However, in some areas of the LEC Planning Area, the sources will need to be augmented in order to meet the projected urban irrigation demands. The concept of a regional irrigation water distribution system was identified as a means to meet these demands using, reclaimed water in the northern Palm Beach County. This system would make irrigation water available for local utilities to distribute. The recommended feasibility analysis will determine the design and magnitude of the irrigation water system.

In the southeastern portion of the LEC Planning Area, it was concluded that existing surficial aquifer and Floridan aquifer system ground water sources are sufficient to meet the 2020 projected urban demands with minimal potential impacts. Some modifications to wellfield configurations and well operations will be needed at the project level to meet a 1-in-10 year level of certainty and avoid potential impacts to water resources and other existing legal users.

Improved management of surface water through storage could increase freshwater availability in the region and reduce potential impacts resulting from water use. ASR technology shows promise both for treated and untreated water by providing a storage option during periods of water availability. This technology is currently being used by several utilities at the local level. In addition to continued use and development at the local level, application of ASR on a regional scale has been identified as a potential storage option to capture excess surface water in several basins including Lake Okeechobee. Regional and local retention projects will reduce excess water discharged to estuarine systems and increase water availability inland by increasing water levels in canals and providing additional ground water recharge.